MECHANOLOGICAL DYNAMICS IN JACQUES LAFITTE AND GILBERT SIMONDON

Marisabel Marratt
Georgia Institute of Technology

Abstract:

> Machines … extension of man, integrating man himself, extensions of social structures, integrating them. They are at any time identical to us. They are us; they are beautiful like us, and ugly like us. To shape them, to build them, is to build ourselves.[1] (Lafitte 1972, 119)

When Jacques Lafitte, a civil engineer, published his pamphlet *Reflexions sur la Science de Machines* (1932, 1972), he was writing across disciplines, developing a methodology that integrated structural theory, kinematics, and mechanical and civil engineering, with works of art and architecture. Contrary to many writings of the period, his work seeks to define and position the machine as a primary force of integration, rather than as a technological object hell-bent on social alienation. Most importantly, he develops a whole new science of machines, mechanology, which proposes a system of classification that expands on the notion of what constitutes a machine, and is organized according to an energetic and functional evolution; within this system, he situates works of architecture. While Lafitte's words have little purchase in the scientific and cultural milieu of the world between the wars, they acquire new resonance in the postwar period, increasingly dominated by cybernetic theory. They will engage French philosopher of technology Gilbert Simondon, who furthers this exploration of mechanology in his own writings; they will serve to focus his thinking concerning technicity as a "mode of existence" in his secondary thesis entitled *On The Mode of Existence of Technical Objects* (1958). In this recently translated work, Simondon outlines a mode of existence particular to technical objects, by presenting the technical object as a field of operation, thus setting in motion an understanding of the movement of technicity as "ontological force." (Hoel, Van der Tuin 2013, 188)

This paper proposes a "chiastic" reading of Lafitte and Simondon, to highlight aspects of their little-known work, and to suggest elements in their thinking that may be relevant to contemporary architectural discourse. This machine that both authors seek to define, albeit differently, is explored as both mechanism and organism, an understanding of which may contribute to the current discourse on emergence, as well as offer a new framework for research in architectural history. This paper encapsulates a portion of the preparatory research for the thesis project: "*Gilbert Simondon: Technicity and Technophany in the Chaine Operatoire*."

Keywords: Simondon, Lafitte, Mechanology, technicity, technical object, machine, technical lineage

> Without man, no machine; no man without machine… Just as earth and water form rivers, each continuously conforming to the other, from primitive times, mechanical structures and social structures have composed … through time, the course of our destiny, have woven the networks of our human life.[2] (Lafitte 1972, 119)

> … a mechanology has existed for a long time, at any rate as a taste, as a tendency and as a poetics of relation between the most perfect industry, or the best equipped science, and Nature at its most natural state, that is to say, the most spontaneous and the most devoid of human contamination …[3] (Simondon 2009, 108)

INTRODUCTION

The study that follows constructs a dynamic of relations between the work of Jacques Lafitte (1884-1966), architect and civil engineer, and Gilbert Simondon (1924-1989), professor in Psychology and philosopher and researcher of Technics. It traces the evolution of a construct, *mechanology*, as it is developed in Lafitte's *Reflexions sur la Science des Machines* (1932) and then resurfaces in Simondon's *On the Mode of Existence of Technical Objects* (1958). Establishing a lineage for mechanology becomes the pretext of a filmed interview between Simondon and Jean Le Moyne that takes place in August of 1968 at Simondon's country home in Mazeaux-par-Tance. The transcript of this interview, "Entretien sur la Mécanologie," would subsequently be annotated and augmented by Simondon in 1970, archived in the Library and National Archives of Quebec in 1976, and only be published for the first time in 2009 (Simondon 2009, 103-106; Thibault 2017).

This dynamic also involves the milieu in which these works first emerge and become entangled in myriad assumptions and conceptions, regarding the definition and scope of machines, and the ways to model the complex phenomenon, man-machine. Both men, working nearly thirty years apart, reveal similar

desires to capture this phenomenon, in order to give voice to machines' true integration in human culture, yet the nature of this integration transforms with changing philosophical, scientific, and epistemological paradigms. (Simondon 2017; Bontems 2005; Hayward and Thibault 2017, Guffroy and Bontems 2018) The transformation in these fundamental paradigms, shift the nature of the enquiry and fuel the dynamic of this relation.

The connection between Lafitte's mechanology and Simondon's work on the technical object as a mode of existence, and technicity as a human reality and motor of an axiology of individuation was made while researching Simondon's course notes on technics and invention, from the period 1968-1969, in "L'Invention et le Développement des Techniques." (Simondon 2005, 77-226) While the two men never actually met, further investigation revealed that events would place Simondon in a one-degree-removed dialogue with Jacques Lafitte. Simondon's research on the essence of technicity as a movement of concretization from abstract to concrete, of interior organicity progressively structuring an evolving exterior reality, suggest affinities with the phylogenetic lineages explored by Lafitte in his mechanology, or science of machines, proposed thirty years earlier.

This essay draws the contours of this connection, exploring the virtual dialogue that occurs between Lafitte and Simondon, through a series of themed interviews, films, and colloquia, between 1968 and 1976. The events that crystallized around this dialogue offer a unique perspective on a time when scientific, philosophical, intellectual, and cultural interests were diverging along radically different paradigmatic lines, specifically with respect to questions of technology and its implications for the cultural coherence and psycho-sociological health of human society. Both men seek to reverse the perception of technology as a destructive and alienating force, yet their point of departure and framework for structuring such a reversal differ in subtle and fundamental ways. (Bontems 2005) This essay takes a closer look at these inversions as a chiasm, a crossing or transfer that provides a more dynamic understanding of these bodies of work, their cultural reception, and their divergences. The relation between the works of the two men should not be understood as a direct filiation, nor refutation of each other, but as a *technomorphing* of associated contexts, technologies, and scientific paradigms (Guffory and Bontems 2018; Bontems 2009; Carrozinni 2009).[4] From Lafitte's conception of mechanology as a theory of the phylogenetic evolution of machines, we are shifted to Simondon's evolving conception of an essential technicity, as an operative enchaining of reticulated and amplified modes of existence. Thus, this chiastic mode of analysis and the shift it offers hopes to concretize an understanding of the essential technicity implicit in emergent phenomena and may suggest a different approach to structuring and understanding historical lineages.

1. ASSEMBLING THE PARTS OF THE MECHANISM

1.1. ESTABLISHING THE CHARACTER OF RELATIONS

Tracing the intellectual history of this construct, *mechanology*, across a thirty year gap also means investigating the mechanics of how this conversation crystallized and how the parts that constitute this dynamic entered into resonance with each other. This study traces the development and evolution of *mechanology* in primary and secondary texts, and also explores how this concept became the rallying point around which a series of interviews, films, and conferences were convened and planned between 1968-1976, with Gilbert Simondon as an invited guest, and orchestrated by Jean Le Moyne (1913-1996), a French Canadian intellectual, essayist, and journalist, and John Hart (1923-2002), a computer scientist at the University of Western Ontario and active promoter and translator of the work of Lafitte and Simondon. (Hayward and Thibault 2017; Simondon 2009, 103-106) The shift that occurs during these events, from traditional publications to film and communications media, extends the cultural aims and reach of the intellectual exchange and also changes its nature. (Thibault 2017; Hayward and Thibault 2017) Given this, one may move beyond a simple comparative survey of the theories of the two men to the understanding that the evolution of mechanology as a construct, was actively negotiated "in real time".

The film footage and transcript of the principal interview constitute important evidence for fleshing out the finer points in the convergence and divergence of ideas between Lafitte and Simondon, and also in relation to the cultural ambitions of the Canadian mechanologist movement, spearheaded by Le Moyne and Hart.[5] These ephemeral transactions often have a tendency to go missing in the historical record; in the context of this study, they are explored as energetic transactions of exchange and transmission, because not only is information being shared, it is also being mediated between the parties, as part of agendas both open and hidden. In the interview itself, the feints and parries between Simondon and Le Moyne, the careful word choices and avoidances, and, as the film stock reveals, the figural intensity of Simondon's gaze and tense posture, which like a coiled spring explodes intermittently in gestural arcs, are indicators that the conversation taking place is not just about paying homage and establishing lineage, as it is about

claiming an intellectual foothold and maintaining one's grasp on the terminology that would structure new paradigms and control future discourse (Hayward and Thibault 2017; Simondon 2009, 103-106).[6]

1.2. THE MECHANISM OF THE MIDDLE

As interviewer-intervener, Le Moyne is the lens through which the lineage is revealed, then traced. Functioning as a third in the relation, his participation is critical and generative and, following the Greek *metaxu* or middle ground, also provides a fertile ground for activating the dynamic of convergence and divergence between the two men. His intervention is meant to validate their assumed common purpose that is to highlight the ever-recurring effort to create a humanist history of machines as a framework for thinking holistically the worlds of machines and men. Le Moyne's lens sharpens the purpose of this exchange: how best to effect this integration in the post-World War II climate, where a proliferation of systems and models for framing reality, to wit cybernetics, information theory, artificial intelligence, and communications technologies, through new tools in mathematics, computerization and communications, risk fragmenting further the project for an integrated human culture (Von Bertalanffy 1969, 19-23; Hayward and Thibault 2017; McLuhan 1994; Wiener 1961; Weiner 1965).[7]

Le Moyne and the Canadian mechanologists focus their effort on the potential of new cultural collaborations emerging across diverse media and specializations. (Hayward and Thibault 2017) A good part of the interview is engaged in brainstorming a film project with Simondon, Le Moyne's project, *La Grande Machine,* which aimed to unfold the genetic history of machines in the visual and temporal medium of film (Thibault 2017). How best to show the continuous evolution of the wheel, for example, within the sequential ruptures of the cinematic medium? This conundrum is debated, pushed, and pulled, as a series of options are discussed, and a resolution is sketched. Then suddenly the discussion breaks. We are on the brink of a philosophical exchange on nominalism, arbitrary natures, and their application to living systems; when the image goes dark, the film winds out, and a gap in the transcript implies a changing of reels. When it restarts, Le Moyne excuses his off-topic musings and shifts from a real-time unfolding of the essence of technicity, back to the script (Simondon 2009, 116-121). The gap, expressed as a literal, physical break in the film sequence, is a temporal reminder of the ghost in the machine and an instance of the chiastic shift experienced between human and technological realities, the hallmark of Simondon's conception of technicity.

Le Moyne's lens seeks to ignite from this material, a utopian vision of unity and a project for the future. (Hayward and Thibault 2017) This aligns with the placement of Lafitte along a line of utopian social visionaries, from Fourier to St. Simon, and continuing a critical assessment of history that had been sketched by Henri Bergson and Elie Faure (Vidler 1999). Yet, the resonances that exist between Lafitte and Simondon, eventually subtend frameworks of a radically different kind. Nevertheless, Simondon's work provides Le Moyne a springboard for establishing mechanology as a viable third way, between two ruling paradigms, cybernetics and the image of man as automaton, and media technologies as the extension of the human (Hayward and Thibault 2017; Barthélémy 2012, 104). In developing the machine-as-technical-object, as a concretization simultaneous to its emerging functional schema and associated milieu, Simondon enlarges the zone of extension to include a zone of immersion and augmentation, in the entwining of physical, metaphysical, cognitive, transindividual, and psycho-sociological modes of existence (Simondon 2013; Simondon 2014; Simondon 2017).

For Lafitte, the sole objective of his work on mechanology is to establish a science that studies and explains the differences between machines and their coming to existence (Lafitte 1972, 32). This contrasts with engineering as the art of constructing machines, and the current science, mechanography, which is descriptive, analytic and solely dedicated to knowing machines as objects, according to conventions of representation and the establishment of a taxonomy of extant types. A significant gap exists, between how Le Moyne chooses to read this work, and Simondon's presentation of the mechanological theme. The gap is a distance that exists according to the diverging agendas of the two men. This distance also reflects a controlled restraint on Simondon's part, in his stated project to discover a principle of individuation, and an axiology for the psycho-social, material, aesthetic and technological realities of technical objects, while avoiding the trap of normalizing structures and other such "human contaminations." (Simondon 2009, 108; Simondon 2013). Simondon's studies in technics, ethnology, phenomenology, ethics, and aesthetics show that a larger field of influences is at play in his vision of a mechanology, than is manifest in Lafitte's linear machine phyla. Still, the shifts in emphasis and terminology in the conversation between Le Moyne and Simondon allow one to investigate the energetics of the mechanological dynamic in its evolution.

The gap, as a movement of immersion, entwining, and inversion constitutes a crossing, in the ancient Greek *chiasmus* and exemplified by the x-shaped letter *chi.* The chiasm is identified as a significant figure in

Simondon's work on individuation, the technical object, techno-aesthetics, and the transindividual.[8] The scope of this essay does not allow expanding on Simondon's conception of the chiasm, nevertheless, it proposes a chiastic reading of Lafitte and Simondon to suggest that there are mechanisms of crossing that are generative, and which serve to render the dynamics of the evolution of technical lineages. Navigating the chiasm between these works reveals that alongside points of resonance, there exist fundamental shifts in the manner of thinking, structuring, and imagining the man-machine relation, whether as mechanism, as organism, or as some other all-encompassing mode of existence.

2. FLUID DYNAMICS AND ACTS OF DEFINITION

2.1. CAPTURING THE *STATUS QUO*: THE EXPERIMENTAL METHOD AND TECHNOMORPHING PARADIGMS

Both Lafitte and Simondon choose to define their projects as divergences from the *status quo*. For Lafitte, this *status quo* does not address machines' powerful integration with culture, and so he offers his work as a new discipline and "a social necessity," and that will provide a mode of analysis "long overdue." Its progress runs parallel with human lines of development, "in slow and almost imperceptible transformations," departing from "raw elements of nature" through "primitive mechanisms," then to those structures of a greater organization, he will define as machines. In this progression, we understand a finality, an ultimate convergence of the linear schema of our creations with the most perfect of "organized living bodies", ourselves (Lafitte 1972, 27).

Lafitte enlarges the scope of machines to encompass all man's constructions that exhibit some semblance of organization in form and functioning, including machinery, musical instruments, devices, tools, toys, and architectural constructions (Lafitte, 1972, 28). For both Lafitte and Simondon, the addition of architecture as foundational for an epistemology of machines is significant (Lafitte 1972, i-viii; Simondon 2005, 11-72; Vidler 1999). The classification of machines as mobile, transforming, automatic and anthropomorphic have long existed, however, Lafitte's classifications are ordered according to the complexity of their internal functioning: from passive, to active, to reflexive machines. A single machine may exhibit properties from each group, depending on changes in the internal state of functioning. In the end, the classifications reflect received notions regarding machines as transformers of movement, then transformers of energy, and finally, in their reflexive mode, as adapting to feedback (Lafitte 1972, 50-73). Lafitte's mechanology as normative science studies the differences between singular examples, and the causes affecting their transformation. This bottom-up approach is dedicated to capturing the phenomenal existence of machines, not a final idealized form. The classification orders the differences observed in form, structure, functioning, and in their general organization; this allows an actual mapping of the genesis of each type and also allows Lafitte to draw a parallel between human development and machine's functioning and organization (Lafitte 1972, 34).

Simondon will make use of Lafitte's classifications, with some modification, during his course development in 1968-1969 (Simondon 2005; Bontems 2017). Yet Simondon's interest lies in proposing the technical object as a technical ensemble of diverse modes of existence; it is neither of man nor of technics, but of nature in man and nature in technics (Barthélémy 2009, 82). He is a "philosopher of concrete particulars," where a sensibility for material specificity is inversely matched by the expansive and reticulated movement of the transindividual in his third term, the network (Hayward and Thibault 2017, 2; Simondon 2009, 129; Barthélémy 2009, 79-80). Both abstract and concrete, his work reflects divergent influences,[9] and is grounded in his research on individuation and the technicity of the technical object, which he develops in his primary and complementary doctoral thesis (Simondon 2013; Simondon 1958). The latter work introduces the genesis and existence of the technical object and its associated milieu, according to notions of an "essential technicity." Simondon's study of technicity is anchored in works of engineering, architecture, art, industrial design, and simple tools and embeds the topologies, materials, and gestures of their becoming. He privileges these technical objects as modes of existence and as introducing a reality that manifests a specific form of participation, a technical mentality that structures its own axiology, according to the conditions of existence (Simondon 2009, "Technical Mentality").

> The technical object is very interesting in the sense that it causes a third term to appear, which is a term of physical reality because the technical object is made from metal, wood, etc.: it comes from nature. Moreover, thus this technical object does not have a violent relation with nature, but when it intervenes between man and nature, it intervenes as a third, as a kind of *metaxu,* organizing the relation and allowing human society to be, with respect to nature, in a relation that is at once extremely concrete but much more refined … more intelligent and interwoven at a greater order of magnitude than if man were to intervene by himself; man by himself causes too much devastation … So I feel the necessity of this third term, which is the network, at the same time nature and man, not just technics: it is technics in one sense, but a technics that is at once nature and man.[10] (Simondon 2009, 129)

If one follows Lafitte, reflexive systems adapting to feedback are a higher-order complex machine approaching the living, but for Simondon they do not encompass the living as an open ensemble of operations, in continuous entanglement with its auto-generation, its psycho-social technicity. Reflexive systems do not allow for the evolution of the essential lines of existence (Simondon 2009). Simondon's project is to uncover the contours of this axiology and to shine a light on the "already always existing" through different phases of individuation. This axiology, as a structuring, is at once abstract and specific, capturing the *haecceity* of distinct modes of existence, while deriving a principle of individuation from this very coming to existence; in this light, he models his thoughts on the technical object (Simondon 2013, 30).

2.2. THE MICRO-MOVEMENT OF DIVERGENCE

Of the distinct resonances that exist between the two men, not the least is the importance of the evolution of technical lineages and the immersion-inversion of technological and aesthetic realities. The differences that exist are a function of each man's time; these do not play out as a dichotomy, but rather as micro-movements in a diverging field. Lafitte's attempt at capturing the transforming *status quo* in a revised system of classification, however broad in its scope and supple in its functioning, still presents like a taxonomy of marvelous things. Contrary to the growing disillusionment with the industrial age that pervades this period (Hayward and Thibault 2017; Lafitte 1972, i-viii), Lafitte's description of skyscrapers, engineered structures, and industrial machines is suffused with a sense of wonder for the energy and scale that are, to him, the sublime apotheosis of a modern age (Lafitte 1972, 34). Whereas Simondon, equally in awe of the marvels of his time, such as the launching of the Sputnik into orbit in 1957, is nonetheless aware that *his* time is experiencing a radical paradigm shift, which is as much technical as it is transformational of man's perception of his position in this world. The age of information has rendered any system based on a simple classification of things, however fluid in their interactions, virtually lifeless (N. Simondon 2014).

Undergirding these differences, are fundamental transformations in the notion of progress. In following a developmental sequence, Lafitte follows a linear and classically teleological movement of perfectioning. This notion of a final perfection pervades, as when he refers to a "certain modern group of architects," for whom form and function necessarily are a unity (Lafitte 1972, 105). Yet, as he lays out his plan, Lafitte will distinguish this unity from an "organic perfectioning," which become the micro-adjustments or adaptations taking place in the internal mechanisms of his machines, culminating in the responsive mechanisms of his reflexive machines (Lafitte 1972, 34). His linear sequences transform to form branching structures that express the micro-adjustments taking place in internal mechanisms. The branching establishes the series, which leads to the genesis of types. As precursors to his thinking, Lafitte acknowledges Franz Reuleaux (1829-1905), Felix Cardellach (1875-1919), and Charles Babbage (1791 -1871), noting in this work that the progressive perfectioning of overall organization parallels a structural perfectioning (Lafitte 1972, 105).

Simondon will complexify this forward march of progress, by rendering it circular, with the capacity to act upon itself, and by proposing "different modalities of the notion of progress" in suggesting that progress itself has a history (Simondon 2017, 129). Essential to this notion of progress is the acceptance of the technical object as an "ensemble of elements"; each at different times undergoes refinement of conception and craft. Progress is thus first experienced by the prehistoric tool bearer, then the artisan, then by *no one*, as technical ensembles become autonomous and self-sustaining, provoking individuals' anxiety and leading to social alienation. The essence of Simondon's idea of progress is the relation with this individual, who is an ensemble of technical and social modalities; associating progress with mathematics' possession of nature is symptomatic of a grave cultural problem. "The alienation of man in relation to the machine does not only have a socio-economic sense; it also has a physio-psychological sense…" (Simondon 2017, 133)

From the perfectioning of an object named machine, we shift to the molecular and augmented notion of individuals and technical objects as psycho-social and technical existence. Simondon's notion of progress of any technological system requires the inverse of perfecting; a technical object prolongs its existence and innovates only insofar as it undergoes a continuous im-perfecting. Im-perfecting involves, a dephasing or *décalage*, of rhythmic alternation, thus effecting a dynamic that is both disrupted and continuous. Each phase undergoes its own temporal transformations simultaneously redefining the trajectory of the ensemble (Simondon 2017, 176). The technical object exists at odds, divided unto itself, and will find in this dephasing the essence of its transformation and evolution (Barthélémy 2009, 80). The idea of perfection is problematic because it is static; it also concerns Simondon because it results in a cultural hysteria that is too quick to establish the obsolescence of objects; this is evidence of a culture that no longer recognizes that the essence of the object lies in its "essential lines" (*lignes essentielles*),

its temporal existence. This surplus-deemed-obsolescence re-establishes the magical unity that precedes such polarizations as culture and technology (Simondon 2009, 109; Simondon 2017, 191-211).

Following this, another fundamental difference will define the point of departure and the resulting epistemologies of the two men. While Lafitte expands the scope of man-made machines as object of enquiry, Simondon is intent on reconfiguring the humanist paradigm as non-centripetal (Simondon 2009, 104). Lafitte's machines parallel the progression and development of man's consciousness: first, a consciousness of form (where a sense of movement is implied), then the forces involved, and then the variations in the forces involved, resulting in his passive, active, and reflexive categories of machines (Lafitte 1972, 85). In Simondon's case, the technical object augments the breadth and depth of the field of humanity, with technicity as the third component in the relation, between man and technics, and technics and nature. Simondon's inversion consists in abandoning this anthropometric model and its linear schema of historical progress, which too easily forgets that variations exist in the field of evolution of technics, of culture, of habit, and of inhabiting. A linear schema for technical modes of existence is impossible in this light. For Simondon, evolution should be schematized as a proliferation, a fanning out. In this fanning out in all directions and according to diverse temporalities, Simondon envisions a radiating and reticulated expanse, where the existence in question is no longer composed of one, and certainly no longer a function solely of man, but of an internal resonance and reciprocity proper to the mode of existence of the relation nature | technics | man (Simondon 2009, 109).

2.3. FRAMING MACHINES | MACHINING FRAMEWORKS: DISTRIBUTIONS AND CLASSIFICATIONS

In his book, Lafitte writes across disciplines. The frontispiece reveals his work as the fruit of a collaboration, when he invokes his progenitors and crisscrosses the movement of their lives. Calling forth the architect-engineer, the artist, the stonemason, the metalsmith, and the sculptor from his lineage, Lafitte provides a personal reflection on the complex dynamic that engenders human realities and the mechanisms with which we forge our identities (Lafitte 1972).

The entwining of machines and men is a potent subject throughout this period, as a survey of the works of cultural criticism, ethnology, sociology, literature, and history would attest. The offerings are varied and heterogenous; and reveal that subtle polarizations are taking place during Lafitte's time. The idea of progress and the myth of modernity is an invigorating tonic for some, while others are increasingly threatened by the heightening industrialization, standardization, and the reformulation of work-as-labor. This perceived mechanization of the world, *machinisme*, variously understood as Taylorism, standardization, homogenization, and the systemized organization of parts, provokes much ambivalence, if not hostility, in Lafitte's day, but by the time Simondon enters the frame, the proliferation of post-World War II systems "solutions" as synonymous with human progress will become even more problematic. These are perceived as mounting an assault on social coherence and the preservation of human value(s). Two tendencies emerge from these conditions; a *technophobia* that refuses the idea that machines, *by any definition*, could be aligned with human nature and a *technophilia*, which becomes the siren song for further abstraction to an entire generation.

Lafitte avoids polarizations of this kind, and seeks a middle ground that would enable exploration of the problem of existence of machines. The challenge is the development of a science capable of describing what happens, rather than describing the outcome of an analysis of preformed facts or objects. By definition, this means that the science of machines as mechanology must constitute itself as "a field" even as an exact definition of what constitutes its boundaries must always elude one's grasp (Lafitte 1973, 32). The process of definition is the first step in the measuring and the perfecting of this knowledge. Laffitte determines his expanded system of description and classification will highlight how machines' existence, *as phenomena*, are distributed and characterized in their functioning. From the founding of this middle ground as both empirical and normative science he hopes to perfect his understanding of machines as a primordial force of integration between nature and humanity. Lafitte's desire to reframe the perception of machines is nonetheless anchored in classical science. Science proceeds by the observation, collection, and measuring of distinct phenomena, and their repetition and variation. To understand the principles and causes of these phenomena, they must first be described, then normalized; i.e., categorized and classified. Only then can these differences or variations be discerned and understood

Yet Lafitte concedes that establishing a definition is problematic, because to define means automatically to assume an attained perfection, thereby circumscribing and limiting the potential of a machine configuration. This framing assumes that the assemblage exists as separate and autonomous from everything that surrounds it, and this is a fallacy, for nothing defines machines better than a living being.

"Any definition that one might propose is nothing more than an approximation … and dangerous because it tends to crystallize in immutable form what is essentially a phenomenal, moving reality. Nothing defines machines better than the living."[11] (Lafitte 1973, 29). Lafitte's system of framing is thus informed by the isomorphic relation between progressions of natural and physiological phenomena and emerging and developing machines; all are seen to follow the same natural order. However, rather than stop at a bio-mimetics and imitation of perfected forms, Lafitte expands his field of reference to include the "vaster science" of organology, and the knowledge of a functioning that subtends all mechanisms, especially but not exclusively those of the living (Lafitte 1973, iv).

Lafitte is not the first to establish a homology between the functioning of machines and the living, but it is striking to follow the implications of this passage for a study of technical lineages and acts of framing. For any form of empirical knowledge to progressively "perfect itself" via the experimental method, the implication is that "All is machine », even the frame, and therefore a "living" system must be elastic and open and not fixed in its constraints. Like some kind of open cellular structure, it should be useful and appropriate, so long as it serves the phenomenon it seeks to define by this framing. The machine, the phenomenon of emergence, and the system of description and classification engender each other.[12] Following Laffite, the system of classification as "*machine opératrice*" and "*machine motrice*," becomes itself machine. The nature of this dynamic of movement will be Simondon's to explore, more specifically with his conception of transduction.[13]

2.4. MACHINE INTERVENTIONS | IMMERSION MACHINES

If all is machine then what of man? The moment arrives in his analysis where the rules of the road established by Lafitte in his archly humanist endeavor lead him to the edge of a precipice from which, by his own admission, he does not dispose of the tools to leap (Lafitte 1973, 62). The underlying implication of this question: if this perfectioning is not the fruit of man's intervention, and follows from an internal progressive ordering, then what is the relation of human intervention to the differentiation and variation of these creations?

The deeply philosophical nature of this question is also a problematic one, as Lafitte considers the means of mapping the characteristics of his study as a science. He troubles the differences and affordances of distribution and classification to make sense of the capture of continuous phenomena. A genealogical distribution in machines is continuous and reproduces the order followed by man in creating it. The distribution is as permanent as the temporal order it follows, and, if observed in its proper sequence, allows identification and marking of invariants over time. On the other hand, a classification is discontinuous, arbitrary, and always in formation because its progress is marked by greater precision and finer tuning (according to progressively granular distributions). The troubling has to do with whether this approximation, in however incremental a fashion, will ever approach the real. The question revives the concerns of the ancient Greeks and, in particular, Zeno's paradoxes. Yet, Lafitte writes in an age when advances in mathematics, the physical and the natural sciences hold some promise of resolving this conundrum.[14] In the end, Lafitte comes to terms with the impossibility of resolving this essential paradox; it seems not possible, because what he seeks to capture (technomorphing) is continuous and, as such, not actually divisible, while classification, which is arbitrary, is by definition and nature nothing other than discontinuity and division (Lafitte 1973, 64).

Lafitte acknowledges he lacks the proper tools, but he does not admit defeat. Man must continue these "stoppages" to increasing levels of granularity, in order to arrive at a point of immersion, to situate oneself, in the ensemble of the distribution. "… our spirit, in order to situate itself in the complex ensemble of this distribution, will deploy stoppages that will serve as moments of rest and points of reference."[15] (Lafitte 1973, 62). The emphasis here is placed, not on the reference points, but on stoppages. These time gaps are experienced as immersion, and crystallize the figures that are the "partial truth" of a continuous reality. It is these discrete and partial moments," the discontinuous figuration of an essentially continuous distribution" that are our artificial constructs, where generation and invention are fused. "At each instant, it cannot be other than a language, an image, ceaselessly perfecting themselves, of a reality that it will only ever be able to express partially."[16] (Lafitte 1973, 64). Lafitte draws the line in the sand, frankly acknowledging that he leaves the problem for a different methodology to tackle. This is less the result of an absence of technical means than of a narrow perceptual bandwidth. Simondon is left to flesh-out the stoppages left by Lafitte and transform the mechanological dynamic into operative chains of reticular modes of existence, as a network that reveals an internal structure of resonances and reflects a human need.

> There would not be a network if there did not exist, a certain natural structure, on the one hand, a certain human need on the other, and then the invention of a harmonious relation between this nature, and human needs. The network is the encounter of technical possibility and a natural existence.[17] (Simondon 2009, 126)

This encounter does not function according to the laws of linear causality, or of a system of distribution and classification perpetually being reframed; it is as a self-structuring alternation of energetic transfer, corporeal perception and technics. "If one wants to understand a being completely, one must study it by considering it in its entelechy and not in its inactivity or its static state." (Simondon 2009 "Technical Mentality," 19). His collected works will place their focus on a lineage of techniques and their essential schemas (*lignes essentielles*), rather than a history of objects defined as machines. This necessarily engages an exploration of a field of relations as *technicity*, and expands the field of perception as the manifestation of a proliferating technical mentality. "*Elle offre aussi un éventail extrêmement large de perception, et même de perception magnifiée, dans le domaine des techniques…*" *(*Simondon 2009, 126). By presenting the genesis of the technical object as a field of operation, Simondon diverges from the nineteenth century model of scientific knowledge, in favor of a modern-day version of alchemical science. He nurtures the emerging technical mentality, an-axiology-in-development, which in its "incomplete genesis" is necessarily messy (Simondon 2009 "Technical Mentality," 17), but which sets in movement an understanding of technicity as an "ontological force." (Hoel and Van der Tuin 2013, 188)

3. THE DYNAMIC OF THE EXCHANGE

3.1. CANADIAN TRANSPOSITIONS: THE HISTORIOGRAPHICAL MOVEMENT

The general contours of this evolving mechanological dynamic now drawn, warrant returning to the conditions that lead to the virtual meeting between Lafitte and Simondon.

Simondon's work exerts a strong influence on a group of Canadian academics and intellectuals in the late 1960s and 1970s. Alongside Le Moyne, John Hart is intent on launching an international dialogue on mechanology, as a means to further his own research interests in computers, automata, and prosthetics.[18] (Hayward and Thibault 2013, Hayward and Thibault 2017, Thibault 2017) Simondon's thesis works precede his discussions with Le Moyne by a decade, yet it is with the ideas developed in the complementary thesis that Le Moyne is specifically concerned. Le Moyne's interests are more analogue, polemical, and anchored in the desire to shape the cultural discourse, through films, exhibitions, and through highlighting the work of key intellectual figures. Both men seek to reinvigorate the perceived mid-twentieth century stalemate between culture and technology, and aim to highlight the profound human engagement with machines, by privileging the poetics of this engagement, the pragmatic necessity of this relation and the logic of its movement (Hayward and Thibault 2017; Thibault 2017).

Hart and Le Moyne anchor a network of collaborators that explore diverse forms of "artistic and intellectual inquiry into "the machine" as an "object of knowledge." (Hayward and Thibault 2017, 450). They wish to further Lafitte's project by "manifesting mechanology," in myriad and heterogeneous media, such as in documentary films, essays, broadcasts, and in designing computer interfaces (Simondon 2009, 104; Hayward and Thibault 2017; Thibault 2017). Yet, the mechanology "movement" never gains much traction, in part out of lack of funding and internal coherence of actions, and also because it is stuck at the crossing between two dominant intellectual paradigms of the time: Norbert Wiener's cybernetics and Marshall McLuhan's ideas on communication and media, emerging from the Toronto School of Communication (Hayward and Thibault 2017; Thibault 2017). These paradigms do not address the cultural aspirations of Hart and Le Moyne, thus their insistence on a third approach, which would encompass the frameworks of science and the humanities. Alongside translations of key texts and filmed interviews with important figures, they organize two symposia on mechanology at the Canadian Cultural Center in Paris in 1971 and 1976, in which many, including Simondon, are important participants (Hayward and Thibault 2017; Simondon 2009, 104; Carrozzini 2009; Guffroy and Bontems 2018).

3.2. THE DYNAMICS OF THE TRANSMISSION

The brief sketch on the history of the mechanology movement in Canada sheds light on the underlying dynamics of the meeting between Simondon and Lafitte. As an actual meeting, the conversation never occurred; instead, the two men met virtually in the context of a series of programmed events, involving Simondon, Hart, and LeMoyne during 1968-1976, during which the conversation around mechanology became progressively more diffuse (Thibault 2017; Bontems, 2018). The transcript of the 1968 interview was reviewed and annotated by Simondon in 1970, and finally submitted to the Library of the National Archive of Quebec in 1976. First published in 2009, "Entretien sur la Mecanologie" then found a second printing in *Sur la Technique* (2014), as part of a compilation of Simondon's writings. It has yet to be translated into English. The transcript and reels of film footage, deposited in the Library and National Archives of Quebec in 1976, were only rediscovered in 2007. Subsequent digital copies were made and disseminated, and a low-resolution copy of each reel of the film stock was made available for viewing on the internet.[19] (Simondon 2009, 103-106)

The archival material from the interview intrigues at many levels: for what is discussed, for how it is staged and then for Simondon's performance as he acts out his energetic schemas with props and diagrams, in a quasi-pantomime of his abstract-concrete approach. The emphasis on the performative aspect of the interview is further underlined by the fact that, although this takes place in August at his country home, Simondon is nonetheless fully suited up and in a lab coat of sorts, at once projecting the image of the messianic technologist and the pithy philosopher-intellectual (Thibault 2017). The camera, positioned as if from the interviewer's point of view, zooms in several times on Simondon's face, as if to capture and pin him down like an entomological specimen in a taxonomy. Vincent Bontems notes the striking stillness and fixity of his gaze one moment, only to be followed by gestural outbursts, while he makes his argument tangible (Simondon 2009, 104). The stoppages of the film stock show the arc of this energetic movement in staccato; they describe a dynamic that is intense, in a continuous alternation between movement and rest, and refusing to be captured. The same may be said about the conversation.

Underlining the dynamics of this exchange is Simondon's apparent refusal to be inserted in a lineage or into the mechanism of others' agenda. He claims only a recent discovery of Lafitte's work and then begs little familiarity with more central cultural references, like Franz Reuleaux and Gaston Bachelard. Simondon studiously avoids being pinned down, except for when he wants to be, which suggests a subtle strategy for directing the course of the conversation. He readily discusses the influence of the cybernetics of Norbert Wiener (1894-1964), the anthropology of André Leroi-Gourhan (1911-1986), and even reflects that a true mechanology exists in the imaginative science fiction of Jules Verne (Simondon 2009, 108). While Simondon may simply be attempting to "stay on message," the reticence to reveal the sources that inform his thinking indeed presents difficulties in tracing his own lineage (Simondon 2009, 103-106).

With these interpersonal dynamics sketched, the transcript of the interview shows that there is also more at play than the coy reluctance to reveal one's hand. Important words, as concretizations, are being negotiated. Le Moyne's *rapprochement* of Simondon and Lafitte consists in conflating such terms as *technical object* and *technicity* with *machine* and *machinisme* (Hayward and Thibault 2017; Simondon 2009). Simondon politely resists using terms like *machine*, and *rationalité* in the conversation, because these belong to paradigms that can no longer speak to the present reality. His studied avoidance of Le Moyne's liberal and searching use of such words as *machine*, *machinisme*, *rationalisme*, and *phénoménologie des éléments,* in preference for his own precise vocabulary of terms, such as *objet technique*, *essence technique*, *lignes essentielles*, *psychosociologie*, *concrétude* and *milieu*, indicate he has in mind a very different constellation of terms for exploring individuation, the transindividual technical object and technicity. Rather than shield his cards, Simondon performs the inverse: he fully plays his hand.

CONCLUSION

In orchestrating this moment of convergence, the Canadian mechanologists had hoped to seed their own movement and ensure its longevity, and *inevitability*, by establishing a continuity of lineage between the works of Jacques Lafitte and Gilbert Simondon. Their hope was to navigate the shifting paradigms of their time, on the bedrock of a historicity of machines. The argument may be made that this is the mechanism with which all histories are set in motion, but, in this case, this was not to be, for reasons that go well beyond the parameters of these series of conversations (Hayward and Thibault 2017; Thibault 2017).

The concept of technical lineages was proposed by Simondon and Lafitte to better understand the "historical evolution of technical objects" (Bontems 2009, 3). From a vision of linearity and continuity, we are shifted to a vision of a history that is non-linear, fanning-out and rhythmic, and which finds its coherence in the reticulated relations and layerings of technical ensembles (Simondon 2009, 126). As this study has hoped to show, the mechanological dynamic that is set in motion by the virtual dialogue between Lafitte and Simondon, reveals a structuring that inverts the "direct line of descent" of a geneaological lineage, for a multi-dimensional, multi-temporal, analogical network of relations.

ENDNOTES

1 Author's translation. "*Les machines? Prolongement de l'homme, s'intégrant à lui-même, prolongement des structures sociales et s'intégrant à elles, elles sont, dans tous les temps, identiques à nous-mêmes. Elles sont nous ; elles sont, comme nous, belles, et laides, comme nous.* »

2 Author's translation. "*Sans homme, pas de machine; pas d'homme sans machine … Comme la terre et l'eau forment les fleuves, l'une à l'autre toujours se conformant, dès les temps primitifs, les structures mécaniques et les structures sociales ont composé, sans cesse, à travers les âges, le cours de nos destins, ont tissé les réseaux de notre vie humaine.* »

3 Author's translation. "*…il y a longtemps qu'une mécanologie existe, tout au moins comme gout, comme tendance et comme poésie du rapport entre l'industrie la plus parfaite, ou la science la mieux équipée, et une nature a l'état le plus naturel, c'est-à-dire la plus primesautier et le plus absent des souillures humaines …* »

4 Lafitte's system finds analogy with nineteenth-century biological sciences, while Simondon's theories reference more contemporaneous developments in science, technology, and the social sciences, from the Theory of Information, cybernetics, and the Laws of Thermodynamics, to psychology, sociology, and ethnology.

5 The research of Mark Hayward and Ghislain Thibault on the history of the mechanology movement in Canada facilitated an understanding of the dynamic between the Canadians and their intellectual sources, as well as the political transformations occurring in Canada during this time.

6 The filmed interview may be accessed in its three reels on YouTube according to the following links. Last accessed 12/12/20
Reel 1/3 https://youtu.be/VLkjI8U5PoQ
Reel 2/3 https://youtu.be/HRqy9vttW-E
Reel 3/3 https://youtu.be/kCBWTHjKvbU

7 If one follows Norbert Wiener's work from his first introduction of cybernetics (1948, 1961) through to his reflections published posthumously (1965), one notes moments of questioning, which some have construed as remorse.

8 A short list of those scholars who have shown interest in the chiasm are: Jean-Hugues Barthélémy, Muriel Combes, and Ludovic Duhem. This influence of the chiasm may draw in part from Simondon's familiarity with the final work of Maurice Merleau-Ponty (1908-1961) (Merleau-Ponty 1968), an important mentor, and to whose memory Simondon dedicates *On the Mode of Existence of Technical Objects* (1958). However, the exact nature of this chiastic crossing for Simondon will also draw from his studies in anthropology, religion, aesthetics, the medieval alchemical sciences, and the physics of the pre-Socratic philosophers.

9 His influences range from studies in ethnology and anthropology with Marcel Mauss, and more importantly, André Leroi-Gourhan, studies in phenomenology, particularly the work of his mentor Maurice Merleau-Ponty, the Psychology and Phenomenology of Henri Bergson, the History of Science and Technology through another mentor Georges Canguilhem, and Norbert Wiener's cybernetics, to name just a few of the principal ones.

10 Authors translation. « *L'objet technique est très intéressant dans la mesure où il fait apparaitre un troisième terme, qui est un terme de réalité physique, car l'objet technique, c'est fait avec du métal, du bois, etc. : il vient de la nature. Et cet objet technique n'a donc pas de rapport de violence avec la nature mais, quand il intervient comme intermédiaire entre l'homme et la nature, il intervient comme un troisième, comme une espèce de metaxu organisant la relation et permettant à la société humaine d'être, par rapport* à la nature, dans un rapport à la fois extrêmement concret mais beaucoup plus raffiné et beaucoup moins dangereux pour l'homme … Mais moins dangereux aussi pour la nature, mois destructive, plus intelligent et tissé sur une plus grand échelle que si l'homme *intervient directement tout seule : l'homme tout seul fait beaucoup de ravages … Donc, je pense qu'il faut le troisième terme, qui est le réseau, à la fois nature et homme, et pas seulement technique ; il est technique en un sens, mais c'est une technique qui est à la fois nature et homme. C'est un troisième terme ; c'est un terme de médiation, un moyen terme comme diraient les Grecs, ce qu'il faut trouver pour organiser la relation. ».*

11 Author's translation. « *Toute définition qui s'en pourra proposer ne sera qu'une approximation … et dangereuse parce qu'elle tend à cristalliser dans une forme immuable l'expression de phénomènes essentiellement mouvantes. On ne définit pas mieux la machine que l'être vivant.* «

12 In this discussion of frames and technology, continuities and discontinuities, one must acknowledge Martin Heidegger's essay, "The Question Concerning Technology" (1957), in which he discusses the essence of technology as an enframing, *gestell*, of man's being-in-the-world. The enframing serves as a gathering together, but it also presents the challenge that the enframing also masks the process of its "bringing-forth" into the world. An exploration of this essay relative to Simondon's work is entirely pertinent, as well as for exploring the conundrum Lafitte encounters with his system.

13 For Simondon, the term transduction avoids the compartmentalization of knowledge and processes that result in alienation and arbitrary divisions between domains, "it expresses individuation and allows it to be thought … *it applies to ontogenesis and is ontogenesis itself*." (Combes 2013, 8) Transduction allows for expression of the process of individuation, as well as the possibility of thinking it. This process bears witness not only to its own becoming, but also to the constellation of relations that emerge along with it, in other words, milieu.

14 Logicians and mathematicians Herman Weyl and Bertrand Russel sought to refute assumptions proposed by Zeno, relative to the divisibility of space, whereas Henri Bergson would propose in *Matter and Memory* (2014) that while space may be divisible, duration – motion is not.

15 Author's translation. *"A défaut d'une représentation de forme mathématique, notre esprit, pour se retrouver dans l'ensemble complexe de cette distribution, y pratiquera des coupures qui lui servent de repos et de points de repère.* »

16 Author's translation. « *Mais par le fait même qu'elle distingue des groups là où il n'en existe réellement pas, par le fait qu'elle donne la figuration discontinue d'une distribution essentiellement continue, elle ne pourra jamais atteindre la vérité par elle-même …. Elle n'est et ne peut être, dans chaque instant, qu'un langage, qu'une image, sans cesse perfectible, d'une réalité qu'elle n'exprimera jamais en son entier.* »

17 Author's translation. « *Il n'y aurait pas de réseau s'il n'y avait pas une certaine structure naturelle d'une part, un certain besoin humain d'autre part, ensuite l'invention d'une relation harmonieuse entre cette nature, et ce besoin humain. Le réseau, c'est la rencontre de la possibilité technique et de l'existence naturelle.* »

18 Hart spearheads and produces an earlier partial translation of Simondon's *On the Mode Of Existence of Technical Objects*. Hart also publishes, in a limited run with his Mechanology Press, a translation of Lafitte's work as *Reflections on the Science of Machines* (1969). An extant copy of this translation was unobtainable, leading to the author's own translations.

19 Refer to note 6.

REFERENCES:

Barthélémy, Jean-Hugues. 2012. « Sur l'Architectonique de *Du Mode d'Existence des Objets Techniques* ». In *Cahiers Simondon Numero 4*, edited by Jean-Hugues Barthélémy, 97-135**.** Paris: L'Harmattan.

Barthélémy, Jean-Hugues. 2009. «Du Mort Qui Saisit le Vif. Sur l'Actualité de l'Ontologie Simondienne». In *Cahiers Simondon Numero 1*, edited by Jean-Hugues Barthélémy, 77-90. Paris: L'Harmattan.

Bergson, Henri. 2014. *Matter and Memory*. Translated by Nancy Margaret Paul and W. Scott Palmer. Kent, England: Solis Press.

Bertalanffy von, Ludwig. 1969. *General System Theory, Foundations, Development, Applications*. New York: George Braziller.

Bontems, Vincent. 2009. "Gilbert Simondon's Genetic « Mechanology » and the Understanding of Laws of Technical Evolution." *Techné,* Vol. 13, No. 1 (Winter): 1-12.

Carrozzini, Giovanni. 2009. "Gilbert Simondon et Jacques Lafitte: Les Deux Discours de la « Culture Technique » .» In *Cahiers Simondon I,* edited by Jean-Hugues Barthélémy, 25-45. Paris: L'Harmattan.

Combes, Muriel. 2013. *Gilbert Simondon and the Philosophy of the Transindividual*. Translated by Thomas LaMarre. Cambridge: MIT Press.

Faure, Elie. 1937. *History of Art: The Spirit of the Forms* (Deluxe Edition). Translated by Walter Pach. Garden City: Zone Books.

Guffroy, Yohann and Vincent Bontems. 2018. "La Mécanologie: Une Lignée Technologique Francophone?» *Artefact*, 8, 2018 : 255-280.

Hayward, Mark and Ghislain Thibault. 2017. "Understanding Machines: A History of Canadian Mechanology." *Canadian Journal of Communication,* Vol 42: 449-466.

Hayward, Mark and Ghislain Thibault. 2013. "Machinic Milieus: Simondon, John Hart and Mechanology." *Disability History Newsletter,* (Fall): 1-5. http://www.disthist.org/newsletter.htm.

Heidegger, Martin. 2013. "The Question Concerning Technology." In *The Question Concerning Technology and Other Essays*, 3-35. San Francisco: Harper Perennial Modern Classics.

Hoel, Aud Sisel and Iris van der Tuin. 2013 "The Ontological Force of Technicity: Reading Cassirer and Simondon Diffractively." *Philosophy of Technology,* Vol 26: 187-202.

Leroi-Gourhan, André. 1973. *Milieu et Technique*. Paris: Editions Albin Michel.

Lafitte, Jacques. 1972. *Réflexions sur la Science des Machines*, introduction by Jacques Guillèrme. Paris: Librairie Philosophique J. Vrin.

McLuhan, Marshall. 1994. *Understanding Media: The Extension of Man*. Cambridge, Mass. and London: MIT Press.

Merleau-Ponty, Maurice. 1968. *The Visible and the Invisible*, edited by Claude Lefort, translated by Alphonso Lingis. Evanston: Northwestern University Press.

Simondon**,** Gilbert. 2005. *L'Invention dans les Techniques Cours et Conferences*, edited by Jean-Yves Château. Paris: Editions du Seuil.

Simondon, Gilbert. 2009. « Entretien Sur la Méchanologie». Introduction by Vincent Bontems. *Revue de Synthèse*, Vol. 130, Series 6, No. 1 : 103-132.

Simondon, Gilbert. 2009. "*Technical Mentality*." Translated by Arne De Boever. *Parrhesia: A Journal of Critical Philosophy,* Number 7: 17-25. http://www.parrhesiajournal.org/.

Simondon, Gilbert. 2013. *L'Individuation a la Lumière des Notions de Forme et d'Information.* Grenoble: Editions Gérôme Million.

Simondon, Gilbert. 2014. *Sur La Technique 1953-1983*. Paris: Presses Universitaires de France.

Simondon, Gilbert. 2017. *On the Mode of Existence of Technical Objects*. Translated by Cecile Malaspina and John Rogove. Minneapolis: University of Minnesota Press.

Simondon, Nathalie. 2013. "Gilbert Simondon Biography." In *Philosophy of Information and Communication*, translated by Andrew Iliadis, 5. http://philosophyofinformationandcommunication.wordpress.com/2013/06/30/gilbert-simondon-biography/. Accessed 2/18/2014.

Thibault, Ghislain. 2017. "Filming Simondon: The National Film Board, Education and Humanism." *Canadian Journal of Film* Vol 26, No. 1, (Spring 2017): 1-23.

Vidler, Anthony. 1999. "Technologies of Space/Spaces of Technology." *Journal of the Society of Architecture Historians* Vol 58, No 3, Architectural History 1999/2000 (Sept. 1999): 482-486.

Wiener, Norbert. 1961. *Cybernetics: or Control and Communication in the Animal and Machine.* Cambridge: MIT Press.

Wiener, Norbert. 1965. *God and Golem, Inc.*. Cambridge Mass. and London: MIT Press.